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(54) PRODUCTION OF DECORATIVE SHEET

(57)Abstract:

PURPOSE: To produce a decorative sheet colored into various color tones by forming a sprayed coating film on a substrate by the use of plural pieces of wire containing Al and Ti and then anodizing this sprayed coating film.

CONSTITUTION: A sprayed coating film is obtained by thermally spraying a metal onto a substrate consisting of inorganic material or organic high polymer material. The thermally spraying metal is at least either of Ti and Al, and plural pieces of wire of this metal is simultaneously melted and sprayed. Subsequently, this sprayed coating film is anodized to form an anodic oxidation film. It is preferable to apply shot peening to the sprayed coating film after thermal spraying. At the time of thermal spraying, the thickness of the Al wire can be different from that of the Ti wire. Because plural pieces of the metallic wire are melted, thermally sprayed grains are increased in size and the mechanical joining strength among mutual grains can be increased. The anodic oxidation film is colored by an electrolytic pigmenting method or a dyeing method.

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CLAIMS

[Claim(s)]

[Claim 1]A manufacturing method of a decorative sheet which is provided with the following, and metal to be used is at least one of Ti and the aluminum in the 1st process, and is characterized by performing thermal spraying so that melting of two or more metaled wires may be carried out simultaneously.
The 1st process of carrying out thermal spraying of the metal and forming a thermally sprayed film on a substrate which consists of non-equipments or an organic high polymer material.
The 2nd process of anodizing the above-mentioned thermally sprayed film and forming an anodic oxide film.

[Claim 2]A manufacturing method of the decorative sheet according to claim 1 which performs shot peening to a thermally sprayed film after thermal spraying in the 1st process.
[Claim 3]A manufacturing method of the decorative sheet according to claim 1 using both aluminum and Ti on the 1st process.
[Claim 4]A manufacturing method of the decorative sheet according to claim 1 which changes thickness of an Al wire and Ti wire in the 1st process using both aluminum and Ti.
[Claim 5]A manufacturing method of the decorative sheet according to claim 3 or 4 which colors an anodic oxide film obtained at the 2nd process with an electrolytic-coloring method or a staining technique.
[Claim 6]A manufacturing method of the decorative sheet according to claim 1 which colors an anodic oxide film obtained at the 2nd process with an electrolytic-coloring method or a staining technique when only aluminum is used in the 1st process.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application]This invention relates to the method that the cheap decorative sheet colored the various color tones which can fully satisfy a consumer's demand can be manufactured.
[0002]
[Description of the Prior Art]The method of forming an anodic oxide film in the base material which consists of metal, for example, aluminum, coloring this with an electrolytic-coloring method or a staining technique, and manufacturing a decorative sheet is publicly known. However, in this method, since a base material consisted of metal, there was a fault that a decorative sheet was expensive. The method of forming a thermally sprayed film in various modes on the other hand on the substrate which consists of non-equipments or an organic high polymer material, and manufacturing a decorative sheet is also publicly known. For example, there are JP,60-147333,A, JP,60-171146,A, etc. In this method, since the substrate consisted of non-equipments or an organic high polymer material and a color tone became only a peculiar color of the metal which carries out thermal spraying although the decorative sheet is cheap, a consumer's demand was not fully able to be satisfied.
[0003]
[Objects of the Invention]An object of this invention is to provide the method that the cheap decorative sheet colored the various color tones which can fully satisfy a consumer's demand can be manufactured.
[0004]
[Means for Achieving the Goal]In [a manufacturing method of the decorative sheet according to claim 1 is provided with the 1st process of carrying out thermal spraying of the metal and forming a thermally sprayed film on a substrate which consists of non-equipments or an

organic high polymer material, and the 2nd process of anodizing the above-mentioned thermally sprayed film and forming an anodic oxide film, and] the 1st process, Metal to be used is at least one of Ti and the aluminum.
It is characterized by performing thermal spraying so that melting of two or more metaled wires may be carried out simultaneously.

[0005]A manufacturing method of the decorative sheet according to claim 2 performs shot peening to a thermally sprayed film after thermal spraying in the 1st process of claim 1.
[0006]Both aluminum and Ti are used for a manufacturing method of the decorative sheet according to claim 3 in the 1st process of claim 1.
[0007]A manufacturing method of the decorative sheet according to claim 4 changes thickness of an Al wire and Ti wire in the 1st process of claim 1 using both aluminum and Ti.
[0008]In the case of claims 3 and 4, a manufacturing method of the decorative sheet according to claim 5 colors an anodic oxide film obtained at the 2nd process with an electrolytic-coloring method or a staining technique.
[0009]A manufacturing method of the decorative sheet according to claim 6 colors an anodic oxide film obtained at the 2nd process with an electrolytic-coloring method or a staining technique, when only aluminum is used in the 1st process of claim 1.
[0010]A usual method using gas, electrical and electric equipment, plasma, etc. as a spraying process of the 1st process is used.
[0011]A usual method is used as an anode oxidation method of the 2nd process. Namely, in an electrolytic bath of solution of the alkalinity of organic acid, such as inorganic acid, such as sulfuric acid, phosphoric acid, and chromic acid, or oxalic acid, sulfosalicylic acid, and malonic acid, or sodium hydroxide, trisodium monophosphate, etc. for example, A method of electrolyzing is used by a direct current, exchange, pulse, PR wave, or a process of superimposed alternating current on direct current.
[0012]A usual method is used as an electrolytic-coloring method or a staining technique.
[0013]
[Function]In the method according to claim 1, since melting of two or more metaled wires is simultaneously carried out in thermal spraying, a spray particle becomes large. Therefore, the collision energy of a spray particle becomes large, the mechanical bonding strength between spray particles increases, it is controlled that the reaction mixture at the time of anodization invades into the interface between spray particles, and omission of a spray particle are prevented. And even if melting is carried out at the time of anodization, a core remains. Therefore, without a thermally sprayed film being omitted, anodization is performed and an anodic oxide film is formed in a thermally sprayed film.
[0014]Since the surface deterioration of the thermally sprayed film has appeared in the formed

anodic oxide film, the color colored the color of an anodic oxide film or this will be seasoned with surface deterioration, and a characteristic color tone is acquired.

[0015]And since non-equipments or an organic high polymer material is used as a substrate, the obtained decorative sheet will become cheap.

[0016]In the method according to claim 2, since the opening between spray particles is crushed while the mechanical bonding strength between spray particles increases with shot peening, it is controlled more certainly [that the reaction mixture at the time of anodization invades into the interface between spray particles].

[0017]In the method according to claim 3, the spray particles of aluminum and Ti will be scattered. According to the usual anode oxidation method, a thick film is formed on Al particles and the interference film which is a thin film is formed on Ti particles. Since the thickness of an interference film is controlled by the voltage and current density at the time of anodization, an interference film assumes various colors. Therefore, the characteristic color tone to which various colors by an interference film are scattered in a color peculiar to the anodic oxide film of aluminum is acquired.

[0018]In the method according to claim 4, since the ratio of aluminum and Ti which constitutes a thermally sprayed film changes, change will be further added to the color tone acquired by the method according to claim 3.

[0019]In the method according to claim 5, since the anodic oxide film of aluminum in claims 3 and 4 is colored various colors, various colors of the anodic oxide film of aluminum will be added to the color tone acquired by claims 3 and 4, and the characteristic color tone which was varied is acquired.

[0020]In the method according to claim 6, since the anodic oxide film of aluminum is colored various colors, a different color tone from a color peculiar to the anodic oxide film of aluminum is acquired.

[0021]

[Example]Hereafter, the example of this invention is described based on figures.

(Example 1) After performing blast processing as ground treatment to the substrate which consists of ceramics first, on the substrate, thermal spraying of the aluminum was carried out and the thermally sprayed film was formed (the 1st process). In this process, thermal spraying was performed as follows. That is, the Al particles which send the current of 180A through both wires, and they were made to generate an arc, melting of the wire size was carried out and it produced using the Al wire which is 1.6 mm two were sprayed on the substrate by air pressure 60PSI.

[0022]Next, the obtained thermally sprayed film was anodized and the anodic oxide film was formed (the 2nd process). Specifically, the thermally sprayed film was first immersed for 1 to 3 minutes into a 60 ** 5% NaOH aqueous solution as pretreatment. Next, as this processing,

where a thermally sprayed film is immersed into [15%H_2SO_4] 20 **, the current of 1 A/dm^2 was impressed for 30 minutes. The microphotograph and drawing 2 which drawing 1 shows the section of a thermally sprayed film in which the anodic oxide film was formed are a partial extension mimetic diagram of drawing 1. Both figures show that the anodic oxide film 2 is thinly formed in the surface of the aluminium-spraying coat 1.

[0023]And the obtained anodic oxide film was colored with the staining technique. As a color, the processing condition was carried out using the trade name "SANODARU red B3LW" (made by a sand company) which is an aluminum color for the dye concentration of 5 g/l, 50-60 ** 3 - 5 minutes. The anodic oxide film after processing assumed red.

[0024]Other things may be used as a color. Coloring of an anodic oxide film may be performed by an electrolytic-coloring method. An epoxy resin etc. may be painted as ground treatment of the 1st process. Ground treatment may be omitted. Non-equipments and organic high polymer materials other than ceramics may be used for a substrate.

[0025](Example 2) The thermally sprayed film of aluminum was first formed in the substrate which consists of ceramics like Example 1 (the 1st process). Shot peening was performed to the obtained thermally sprayed film. The condition was made into suction type 3 kg/cm^2 using the glass bead.

[0026]Next, the thermally sprayed film was anodized like Example 1, and the anodic oxide film was formed (the 2nd process).

[0027]And the obtained anodic oxide film was colored by the electrolytic-coloring method. The anodic oxide film was immersed into a 100-g/l nickel sulfate aqueous solution, and, specifically, the voltage of 25V was impressed for 1 minute. The anodic oxide film after processing assumed bronze colors.

[0028]Other things may be used as metal salt used for an electrolytic-coloring method. Coloring of an anodic oxide film may be performed with a staining technique. An epoxy resin etc. may be painted as ground treatment of the 1st process. Ground treatment may be omitted. Non-equipments and organic high polymer materials other than ceramics may be used for a substrate.

[0029](Example 3) First, on the substrate which consists of ABS plastics, thermal spraying of Ti was carried out and the thermally sprayed film was formed (the 1st process). In this process, thermal spraying was performed as follows. That is, the Ti particles which send the current of 250A through both wires, and they were made to generate an arc, melting of the path was carried out and it produced using Ti wire which is 1.6 mm two were sprayed on the substrate by air pressure 65PSI.

[0030]Next, the obtained thermally sprayed film was anodized and the anodic oxide film was formed (the 2nd process). Where a thermally sprayed film is immersed into 20 ** 10%

trisodium monophosphate solution, specifically, the current of 1 A/dm^2 was impressed for 30 minutes. The obtained anodic oxide film assumed the blue color.

[0031]In the 1st process, ground treatment, such as coating treatment, such as blast processing and an epoxy resin, may be performed. Organic high polymer materials and non-equipments other than ABS plastics may be used for a substrate.

[0032]In the 2nd process, if current density and voltage are changed, the color which the obtained anodic oxide film assumes will change to a different color from the above-mentioned color.

[0033](Example 4) After performing blast processing as ground treatment to the substrate which consists of ceramics first, on the substrate, thermal spraying of aluminum and Ti was carried out simultaneously, and the thermally sprayed film was formed (the 1st process). In this process, thermal spraying was performed as follows. That is, the Al particles and Ti particles which send the current of 210A through both wires, and they were made to generate an arc, melting of the wire size was carried out and it produced as well as the Al wire which is 1.6 mm using Ti wire every one were sprayed on the substrate by air pressure 65PSI. Shot peening was performed to the obtained thermally sprayed film. The condition was made into suction type 3 kg/cm^2 using the glass bead.

[0034]Next, the obtained thermally sprayed film was anodized and the anodic oxide film was formed (the 2nd process). Where a thermally sprayed film is immersed into 20 ** 10% trisodium monophosphate solution, specifically, the current of 1 A/dm^2 was impressed for 30 minutes. In the portion of aluminum, the portions of opalescence and Ti became a blue color, and the obtained anodic oxide film became the color tone to which both colors were scattered in punctiform.

[0035]An epoxy resin etc. may be painted as ground treatment of the 1st process. Ground treatment may be omitted. Non-equipments and organic high polymer materials other than ceramics may be used for a substrate.

[0036](Example 5) The wire size of an Al wire and Ti wire was changed, and others were performed like Example 4. The wire size of the Al wire was 2.0 mm, and, specifically, the wire size of Ti wire was 1.5 mm. The color tones scattered in punctiform [of the obtained anodic oxide film] became what has many opalescence which is the portions of aluminum as compared with Example 4.

[0037](Example 6) Example 5 made the wire size of the Al wire reverse more thinly than Ti wire, and others were performed like Example 4. The wire size of the Al wire was 1.5 mm, and, specifically, the wire size of Ti wire was 2.0 mm. The color tones scattered in punctiform [of the obtained anodic oxide film] became what has many blue colors which are the portions of Ti as compared with Example 4.

[0038](Example 7) After obtaining an anodic oxide film like Example 4, the anodic oxide film was colored with the staining technique. As a color, the processing condition was carried out using the trade name "SANODARU red B3LW" (made by a sand company) which is an aluminum color for the dye concentration of 5 g/l, 50-60 ** 3 - 5 minutes. In the portion of aluminum, the portions of red and Ti became a blue color, and the anodic oxide film after processing became the color tone to which both colors were scattered in punctiform. An electrolytic-coloring method may be used instead of a staining technique.
[0039](Example 8) After obtaining an anodic oxide film like Example 5, the anodic oxide film was colored by the electrolytic-coloring method. The anodic oxide film was immersed into a 100-g/l nickel sulfate aqueous solution, and, specifically, the voltage of 25V was impressed for 1 minute. As compared with Example 5, as for the anodic oxide film after processing, the portion of aluminum became bronze colors. A staining technique may be used instead of an electrolytic-coloring method.
[0040](Example 9) After obtaining an anodic oxide film like Example 6, the anodic oxide film was colored with the staining technique. As a color, the processing condition was carried out using the trade name "SANODARU red B3LW" (made by a sand company) which is an aluminum color for the dye concentration of 5 g/l, 50-60 ** 3 - 5 minutes. As compared with Example 6, as for the anodic oxide film after processing, the portion of aluminum became red. An electrolytic-coloring method may be used instead of a staining technique.
[0041]
[Effect of the Invention]According to the manufacturing method of the decorative sheet of this invention, the following effects are done so as mentioned above.
(1) Since according to the method according to claim 1 melting of the metaled wire is carried out simultaneously and thermal spraying is made and carried out two or more, thermal spraying of the big spray particle can be carried out. Therefore, the mechanical bonding strength between spray particles can be increased, and it can control that the reaction mixture at the time of anodization invades into the interface between spray particles, and can leave a core. For this reason, a thermally sprayed film can be prevented from being omitted at the time of anodization, and an anodic oxide film can be formed in the thermally sprayed film formed on the substrate which consists of non-equipments or an organic high polymer material. Therefore, the anodic oxide film which becomes the origin which expresses various color tones with a cheap substrate can be formed, and manufacture of a cheap decorative sheet is enabled.
[0042]And since a thermally sprayed film is anodized and the anodic oxide film is formed, the surface deterioration of a thermally sprayed film can be expressed to an anodic oxide film. Therefore, the color colored the color of an anodic oxide film or this can be seasoned with surface deterioration, and it makes it possible to acquire a characteristic color tone.

[0043](2) Since shot peening has been performed to the thermally sprayed film according to the method according to claim 2, while being able to increase the mechanical bonding strength between spray particles, the opening between spray particles can be crushed. Therefore, it can control more certainly that reaction mixture invades into the interface between spray particles at the time of anodization, and the effect by claim 1 can be demonstrated more certainly.

[0044](3) Since the spray particles of aluminum and Ti can be made scattered according to the method according to claim 3, the thick film on Al particles and the interference films on Ti particles can be made scattered by anodization. Therefore, the characteristic color tone to which various colors by an interference film are scattered in a color peculiar to the anodic oxide film of aluminum can be acquired.

[0045](4) Since the ratio of aluminum and Ti which constitutes a thermally sprayed film can be changed according to the method according to claim 4, the color tone acquired by the method according to claim 3 is made to what was further varied.

[0046](5) the color tone acquired by claims 3 and 4 since the anodic oxide film of aluminum in claims 3 and 4 was colored various colors according to the method according to claim 5 -- various colors of the anodic oxide film of aluminum -- in addition, the characteristic color tone which was varied can be acquired.

[0047](6) Since the anodic oxide film of aluminum can be colored various colors according to the method according to claim 6, a different color tone from a color peculiar to the anodic oxide film of aluminum can be acquired.

[Translation done.]

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(54)【発明の名称】　化粧板の製造方法

(57)【要約】

【目的】　需要者の要求に充分に対応できる多様な色調に着色された安価な化粧板を製造できる方法を提供することである。

【構成】　無機材又は有機高分子材からなる基板上に、ＡｌワイヤとＴｉワイヤを同時に溶融させるようにして溶射して溶射皮膜を形成し、この溶射皮膜を陽極酸化して陽極酸化皮膜を形成することを特徴としている。

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【特許請求の範囲】

【請求項１】　無機材又は有機高分子材からなる基板上に、金属を溶射して溶射皮膜を形成する第１工程と、上記溶射皮膜を陽極酸化して陽極酸化皮膜を形成する第２工程とを備え、

第１工程において、用いる金属がＴｉ、Ａｌの内の少なくとも一方であり、溶射を、金属のワイヤを複数本同時に溶融させるように行なうことを特徴とする化粧板の製造方法。

【請求項２】　第１工程において、溶射の後に、溶射皮膜に対してショットピーニングを施す請求項１記載の化粧板の製造方法。

【請求項３】　第１工程において、Ａｌ及びＴｉの両者を用いる請求項１記載の化粧板の製造方法。

【請求項４】　第１工程において、Ａｌ及びＴｉの両者を用い、ＡｌワイヤとＴｉワイヤの太さを異ならせる請求項１記載の化粧板の製造方法。

【請求項５】　第２工程で得られた陽極酸化皮膜を電解着色法又は染色法により着色する請求項３又は４記載の化粧板の製造方法。

【請求項６】　第１工程においてＡｌのみを用いた場合に、第２工程で得られた陽極酸化皮膜を電解着色法又は染色法により着色する請求項１記載の化粧板の製造方法。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、需要者の要求に充分に対応できる多様な色調に着色された安価な化粧板を製造できる方法に関するものである。

【０００２】

【従来の技術】金属例えばＡｌからなる母材に陽極酸化皮膜を形成し、これを電解着色法又は染色法により着色して化粧板を製造する方法は、公知である。しかし、この方法では、母材が金属からなるため、化粧板が高価であるという欠点があった。一方、無機材や有機高分子材からなる基板上に溶射皮膜を種々の態様で形成して化粧板を製造する方法も、公知である。例えば、特開昭６０－１４７３３３、特開昭６０－１７１１４６等がある。この方法では、基板が無機材や有機高分子材からなっているので、化粧板は安価であるが、色調が溶射する金属の固有の色にしかならないため、需要者の要求に充分に対応することはできなかった。

【０００３】

【発明の目的】本発明は、需要者の要求に充分に対応できる多様な色調に着色された安価な化粧板を製造できる方法を提供することを目的とする。

【０００４】

【目的を達成するための手段】請求項１記載の化粧板の製造方法は、無機材又は有機高分子材からなる基板上に、金属を溶射して溶射皮膜を形成する第１工程と、上記溶射皮膜を陽極酸化して陽極酸化皮膜を形成する第２工程とを備え、第１工程において、用いる金属がＴｉ、Ａｌの内の少なくとも一方であり、溶射を、金属のワイヤを複数本同時に溶融させるように行なうことを特徴としている。

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【０００５】請求項２記載の化粧板の製造方法は、請求項１の第１工程において、溶射の後に、溶射皮膜に対してショットピーニングを施すものである。

【０００６】請求項３記載の化粧板の製造方法は、請求項１の第１工程において、Ａｌ及びＴｉの両者を用いるものである。

【０００７】請求項４記載の化粧板の製造方法は、請求項１の第１工程において、Ａｌ及びＴｉの両者を用い、ＡｌワイヤとＴｉワイヤの太さを異ならせるものである。

【０００８】請求項５記載の化粧板の製造方法は、請求項３、４の場合において、第２工程で得られた陽極酸化皮膜を電解着色法又は染色法により着色するものである。

【０００９】請求項６記載の化粧板の製造方法は、請求項１の第１工程においてＡｌのみを用いた場合に、第２工程で得られた陽極酸化皮膜を電解着色法又は染色法により着色するものである。

【００１０】なお、第１工程の溶射法としては、ガス、電気、プラズマ等を用いた通常の方法が用いられる。

【００１１】第２工程の陽極酸化法としては、通常の方法が用いられる。即ち、例えば硫酸、リン酸、クロム酸等の無機酸、又はシュウ酸、スルホサリチル酸、マロン酸等の有機酸、又は水酸化ナトリウム、リン酸三ナトリウム等のアルカリ性の水溶液の電解浴中で、直流、交流、パルス、ＰＲ波、又は交直重畳法により、電解する方法が用いられる。

【００１２】電解着色法や染色法としては、通常の方法が用いられる。

【００１３】

【作用】請求項１記載の方法においては、溶射において金属のワイヤを複数本同時に溶融させるので、溶射粒子が大きくなる。そのため、溶射粒子の衝突エネルギーが大きくなり、溶射粒子相互の機械的接合強度が増大し、溶射粒子間の界面に陽極酸化時の反応液が侵入するのが抑制され、溶射粒子の脱落が防止される。しかも、陽極酸化時に溶融されても、核が残る。従って、溶射皮膜が脱落することなく、陽極酸化が行なわれ、溶射皮膜に陽極酸化皮膜が形成される。

【００１４】また、形成された陽極酸化皮膜には、溶射皮膜の肌荒れが現れているので、陽極酸化皮膜の色又はこれに着色する色に、肌荒れが加味されることとなり、特有の色調が得られる。

【００１５】しかも、基板として、無機材又は有機高分子材を用いているので、得られた化粧板は安価なものと

なる。

【００１６】請求項２記載の方法においては、ショットピーニングによって、溶射粒子相互の機械的接合強度が増大されるとともに溶射粒子間の空隙が潰されるので、溶射粒子間の界面に陽極酸化時の反応液が侵入するのがより確実に抑制される。

【００１７】請求項３記載の方法においては、ＡｌとＴｉの溶射粒子が散在することとなる。通常の陽極酸化法によれば、Ａｌ粒子上には厚膜が形成され、Ｔｉ粒子上には薄膜である干渉膜が形成される。干渉膜の厚さは陽極酸化時の電圧や電流密度で制御されるので、干渉膜は種々の色を呈する。従って、Ａｌの陽極酸化皮膜固有の色の中に干渉膜による種々の色が散在してなる特有の色調が得られる。

【００１８】請求項４記載の方法においては、溶射皮膜を構成するＡｌとＴｉの比率が変化するため、請求項３記載の方法により得られる色調に更に変化が加わることとなる。

【００１９】請求項５記載の方法においては、請求項３、４におけるＡｌの陽極酸化皮膜が種々の色に着色されるので、請求項３、４で得られた色調に、Ａｌの陽極酸化皮膜の種々の色が加わることとなり、変化に富んだ特有の色調が得られる。

【００２０】請求項６記載の方法においては、Ａｌの陽極酸化皮膜が種々の色に着色されるので、Ａｌの陽極酸化皮膜固有の色とは異なった色調が得られる。

【００２１】

【実施例】以下、本発明の実施例を図に基づいて説明する。

（実施例１）まず、セラミックからなる基板に、下地処理としてのブラスト処理を施した後、基板上にＡｌを溶射して溶射皮膜を形成した（第１工程）。この工程において、溶射は次のように行なった。即ち、線径が１．６ｍｍであるＡｌワイヤを２本用い、両ワイヤに１８０Ａの電流を流してアークを発生させ、溶融されて生じたＡｌ粒子をエアー圧６０ＰＳＩで基板上に吹付けた。

【００２２】次に、得られた溶射皮膜を陽極酸化して陽極酸化皮膜を形成した（第２工程）。具体的には、まず、前処理として、溶射皮膜を、６０℃の５％ＮａＯＨ水溶液中に１～３分間浸漬した。次に、本処理として、溶射皮膜を２０℃の１５％H_2SO_4中に浸漬した状態で１Ａ／ｄｍ²の電流を３０分間印加した。図１は陽極酸化皮膜の形成された溶射皮膜の断面を示す顕微鏡写真、図２は図１の一部拡大模式図である。両図から、アルミニウム溶射皮膜１の表面に薄く陽極酸化皮膜２が形成されていることがわかる。

【００２３】そして、得られた陽極酸化皮膜を染色法により着色した。染料としては、アルミニウム染料である商品名「サノダールレッドＢ３ＬＷ」（サンド社製）を用い、処理条件は、染料濃度５ｇ／ｌ、５０～６０℃、３～５分間とした。処理後の陽極酸化皮膜は、赤色を呈した。

【００２４】なお、染料としては、他のものを用いてもよい。また、陽極酸化皮膜の着色は電解着色法で行なってもよい。また、第１工程の下地処理として、エポキシ樹脂等を塗装してもよい。また、下地処理は省略してもよい。また、基板には、セラミック以外の無機材や有機高分子材を用いてもよい。

【００２５】（実施例２）まず、セラミックからなる基板に、実施例１と同様にして、Ａｌの溶射皮膜を形成した（第１工程）。なお、得られた溶射皮膜に対しては、ショットピーニングを施した。その条件は、ガラスビーズを用い、吸引式３ｋｇ／ｃｍ²とした。

【００２６】次に、溶射皮膜を、実施例１と同様に陽極酸化して陽極酸化皮膜を形成した（第２工程）。

【００２７】そして、得られた陽極酸化皮膜を電解着色法により着色した。具体的には、陽極酸化皮膜を、１００ｇ／ｌの硫酸ニッケル水溶液中に浸漬し、２５Ｖの電圧を１分間印加した。処理後の陽極酸化皮膜は、ブロンズ色を呈した。

【００２８】なお、電解着色法に用いる金属塩としては、他のものを用いてもよい。また、陽極酸化皮膜の着色は染色法で行なってもよい。また、第１工程の下地処理として、エポキシ樹脂等を塗装してもよい。また、下地処理は省略してもよい。また、基板には、セラミック以外の無機材や有機高分子材を用いてもよい。

【００２９】（実施例３）まず、ＡＢＳ樹脂からなる基板上にＴｉを溶射して溶射皮膜を形成した（第１工程）。この工程において、溶射は次のように行なった。即ち、径が１．６ｍｍであるＴｉワイヤを２本用い、両ワイヤに２５０Ａの電流を流してアークを発生させ、溶融されて生じたＴｉ粒子をエアー圧６５ＰＳＩで基板上に吹付けた。

【００３０】次に、得られた溶射皮膜を陽極酸化して陽極酸化皮膜を形成した（第２工程）。具体的には、溶射皮膜を２０℃の１０％リン酸三ナトリウム水溶液中に浸漬した状態で１Ａ／ｄｍ²の電流を３０分間印加した。得られた陽極酸化皮膜は、ブルー色を呈した。

【００３１】なお、第１工程においては、ブラスト処理やエポキシ樹脂等の塗装処理等の下地処理を施してもよい。また、基板には、ＡＢＳ樹脂以外の有機高分子材や無機材を用いてもよい。

【００３２】また、第２工程において、電流密度や電圧を変えれば、得られた陽極酸化皮膜の呈する色は上記色とは異なった色に変化する。

【００３３】（実施例４）まず、セラミックからなる基板に、下地処理としてのブラスト処理を施した後、基板上にＡｌ及びＴｉを同時に溶射して溶射皮膜を形成した（第１工程）。この工程において、溶射は次のように行なった。即ち、線径が１．６ｍｍであるＡｌワイヤと同

じくＴｉワイヤを１本ずつ用い、両ワイヤに２１０Ａの電流を流してアークを発生させ、溶融されて生じたＡｌ粒子及びＴｉ粒子をエアー圧６５ＰＳＩで基板上に吹付けた。なお、得られた溶射皮膜に対しては、ショットピーニングを施した。その条件は、ガラスビーズを用い、吸引式３ｋｇ／ｃｍ²とした。

【００３４】次に、得られた溶射皮膜を陽極酸化して陽極酸化皮膜を形成した（第２工程）。具体的には、溶射皮膜を２０℃の１０％リン酸三ナトリウム水溶液中に浸漬した状態で１Ａ／ｄｍ²の電流を３０分間印加した。得られた陽極酸化皮膜は、Ａｌの部分が乳白色、Ｔｉの部分がブルー色となり、両色が点状に散在した色調となった。

【００３５】なお、第１工程の下地処理として、エポキシ樹脂等を塗装してもよい。また、下地処理は省略してもよい。また、基板には、セラミック以外の無機材や有機高分子材を用いてもよい。

【００３６】（実施例５）ＡｌワイヤとＴｉワイヤの線径を異ならせ、その他は実施例４と同様に行なった。具体的には、Ａｌワイヤの線径を２．０ｍｍとし、Ｔｉワイヤの線径を１．５ｍｍとした。得られた陽極酸化皮膜の点状に散在した色調は、実施例４に比してＡｌの部分である乳白色が多いものとなった。

【００３７】（実施例６）実施例５とは逆にＡｌワイヤの線径をＴｉワイヤより細くし、その他は実施例４と同様に行なった。具体的には、Ａｌワイヤの線径を１．５ｍｍとし、Ｔｉワイヤの線径を２．０ｍｍとした。得られた陽極酸化皮膜の点状に散在した色調は、実施例４に比してＴｉの部分であるブルー色が多いものとなった。

【００３８】（実施例７）実施例４と同様にして陽極酸化皮膜を得た後、陽極酸化皮膜を染色法により着色した。染料としては、アルミニウム染料である商品名「サノダールレッドＢ３ＬＷ」（サンド社製）を用い、処理条件は、染料濃度５ｇ／ｌ、５０～６０℃、３～５分間とした。処理後の陽極酸化皮膜は、Ａｌの部分が赤色、Ｔｉの部分がブルー色となり、両色が点状に散在した色調となった。なお、染色法の代わりに電解着色法を用いてもよい。

【００３９】（実施例８）実施例５と同様にして陽極酸化皮膜を得た後、陽極酸化皮膜を電解着色法により着色した。具体的には、陽極酸化皮膜を、１００ｇ／ｌの硫酸ニッケル水溶液中に浸漬し、２５Ｖの電圧を１分間印加した。処理後の陽極酸化皮膜は、実施例５に比してＡｌの部分がブロンズ色となった。なお、電解着色法の代わりに染色法を用いてもよい。

【００４０】（実施例９）実施例６と同様にして陽極酸化皮膜を得た後、陽極酸化皮膜を染色法により着色した。染料としては、アルミニウム染料である商品名「サノダールレッドＢ３ＬＷ」（サンド社製）を用い、処理条件は、染料濃度５ｇ／ｌ、５０～６０℃、３～５分間

とした。処理後の陽極酸化皮膜は、実施例６に比してＡｌの部分が赤色となった。なお、染色法の代わりに電解着色法を用いてもよい。

【００４１】

【発明の効果】以上のように本発明の化粧板の製造方法によれば、以下のような効果を奏する。

（１）請求項１記載の方法によれば、金属のワイヤを複数本同時に溶融させるようにして溶射するので、大きな溶射粒子を溶射できる。従って、溶射粒子相互の機械的接合強度を増大でき、溶射粒子間の界面に陽極酸化時の反応液が侵入するのを抑制でき、また、核を残すことができる。このため、陽極酸化時に溶射皮膜が脱落するのを防止でき、無機材又は有機高分子材からなる基板上に形成した溶射皮膜に陽極酸化皮膜を形成できる。従って、安価な基板に、多様な色調を現す元となる陽極酸化皮膜を形成でき、安価な化粧板の製造を可能にできる。

【００４２】しかも、溶射皮膜を陽極酸化して陽極酸化皮膜を形成しているので、陽極酸化皮膜に溶射皮膜の肌荒れを現すことができる。従って、陽極酸化皮膜の色又はこれに着色する色に、肌荒れを加味でき、特有の色調を得ることを可能にできる。

【００４３】（２）請求項２記載の方法によれば、溶射皮膜に対してショットピーニングを施しているので、溶射粒子相互の機械的接合強度を増大できるとともに溶射粒子間の空隙を潰すことができる。従って、陽極酸化時に反応液が溶射粒子間の界面に侵入するのをより確実に抑制でき、請求項１による効果をより確実に発揮できる。

【００４４】（３）請求項３記載の方法によれば、ＡｌとＴｉの溶射粒子を散在させることができるので、陽極酸化によって、Ａｌ粒子上の厚膜とＴｉ粒子上の干渉膜とを散在させることができる。従って、Ａｌの陽極酸化皮膜固有の色の中に干渉膜による種々の色が散在してなる特有の色調を得ることができる。

【００４５】（４）請求項４記載の方法によれば、溶射皮膜を構成するＡｌとＴｉの比率を変化させることができるので、請求項３記載の方法により得られる色調を更に変化に富んだものにできる。

【００４６】（５）請求項５記載の方法によれば、請求項３、４におけるＡｌの陽極酸化皮膜を種々の色に着色できるので、請求項３、４で得られた色調に、Ａｌの陽極酸化皮膜の種々の色を加えて、変化に富んだ特有の色調を得ることができる。

【００４７】（６）請求項６記載の方法によれば、Ａｌの陽極酸化皮膜を種々の色に着色できるので、Ａｌの陽極酸化皮膜固有の色とは異なった色調を得ることができる。

【図面の簡単な説明】

【図１】　図面に代わる写真であって、実施例１において陽極酸化皮膜の形成された溶射皮膜の断面を示す顕微

7　　8

鏡写真である。

【図2】　図1の一部拡大模式図である。

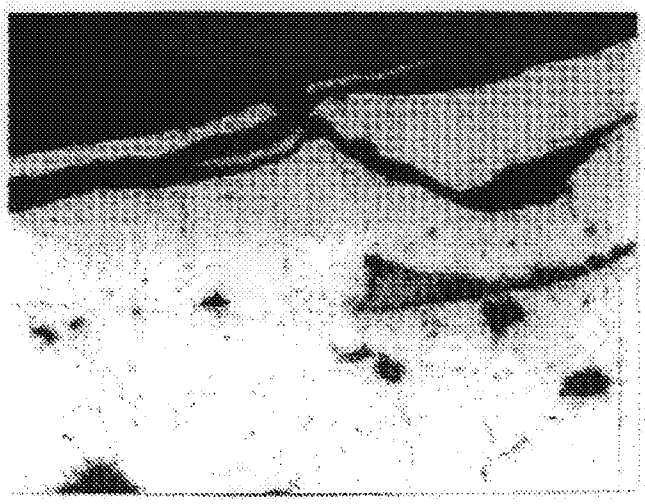
【符号の説明】

1　アルミニウム溶射皮膜

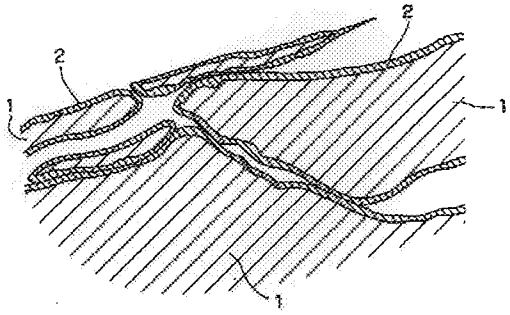
2　陽極酸化皮膜

【図1】

図面代用写真



【図2】



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